1.1 Radio Astronomy

1.1.1 Maintenance and Calibration

- MarkIV VLBI recorders maintenance: performed two successful headstack calibrations on recorder#2. Performed semi-annual and monthly tests on MarkIV data acquisition terminal and MarkIV recorder#2 with help of the CDE.
- K-band DSS-63 downconverters maintenance: found that MMS#1 (modular measurement system) pre-amplifier#1 does not properly amplify the signal (ATOT, 145min), replaced by pre-amplifier#2.
- Performed a calibration run in K-band with DSS-63 antenna, using the Antenna Calibration and Measurement Equipment (ACME) to derive a new encoder pointing model (ATOT, 515min).
- Installed a patch at Field System software to solve a problem with Digital Tone Extractor (DTE) station dependent software. New software was used to successfully support the Space Geodesy Program observation on DOY 176.
- Mark5 recorder#2 bank B problem solved by the CDE. Found and fix a design problem that was notified to the manufacturer (Conduant).
- Installation of the Q-band system (DSS-54) fiber optics transmitter and receiver units. Performed first minical measurements using exp_control and power meters located at the antenna, not enough signal is detected when the pre-selectors are turned on, problem to be investigated. Additionally performed first pointing checks using ACME over Taurus A source (ATOT, 405min).
- Performed a calibration run in Q-band with DSS-54 antenna, using ACME to derive the first pointing model (ATOT, 455min).
- In preparation for Space Geodesy Program (SGP) observation in S/X-bands, observing files were generated locally, and Mark5 modules received from Bonn correlator were conditioned.

1.1.2 Observations

1.1.2.1 Host Country Spectroscopy

During this month spectroscopy observations with DSS-63 antenna were carried out using the SPB500 spectrometer and the MarkIV data acquisition terminal. Following Host Country projects were performed using DSS-63 antenna:

- **D63-S02:** search for water maser emission toward optically obscured planetary nebulae. This project will allow to test the prediction that the precursors of planetary nebulae (PNe) might be optically obscured post-AGB stars with water fountains.

- **D63-S09:** Target of opportunity (TO): confirmation of a tentative detection of ammonia (NH3) emission towards a very young and cold brown dwarf.

DOY	minutes scheduled	minutes used	Percent good data	Activity	comments
157	555	555	100	"GBRA Host Country D63-S02"	
165	425	190	40	"GBRA Host Country D63-S02"	s/w problems
172	535	290	60	"GBRA Host Country D63-S02"	boresights problems
179	600	210	60	"GBRA Host Country D63-S02/S09"	TO, s/w problems

1.1.2.2 Interferometry

MDSCC participated in 4 Very Long Baseline Interferometric (VLBI) observations (3205 min in total):

- RFC Clock Synchronization on DSS-65 (1 observation; 240 min): 100% data collected, performance of the system nominal.
- European VLBI Network (EGS project) on DSS-63 (1 observation; 385 min): 100% data collected, noticed instabilities on IF#1 signal (MMS#1 downconverter), problem currently under investigation. No problems experienced with Mark5 recorder (512Mbps). System temperature file was derived using *antabfs* application and sent to EVN archive.
- RFC Catalog M&E on DSS-65 (1 observation; 1440 min): antenna stopped in AZ in several occasions (DR#M104892), 32 sources were impacted (9% data lost).
- EUROPE Space Geodesy Program on DSS-65 (1 observation; 1140 min): 2% data lost due to antenna problems (DR#M104914). Observation log and system temperature file (*antabfs*) sent to SGP server. Calibration signal (noise diode) only fired until 22:15UT.